# Lucas Janson

Assistant Professor of Statistics

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## Biosketch

Lucas Janson is an Assistant Professor in the Department of Statistics at Harvard University, where he works on high-dimensional inference and statistical machine learning. Prior to Harvard, he was a PhD student in Statistics at Stanford University advised by Professor Emmanuel Candès.

## Education

**Stanford University** (Stanford, CA), Ph.D. in Statistics, 2017. Advisor: Prof. E. Candès.

**Stanford University** (Stanford, CA), M.S. in Statistics, 2011.

**Stanford University** (Stanford, CA), B.S. in Mathematics (with Honors) and Physics, 2011.

## Employment

**Assistant Professor**, Harvard University Department of Statistics, Cambridge, MA (2017–present).

**Quantitative Analyst**, Goldman Sachs: Quantitative Investment Strategies, New York, NY (2011–2012)

## Affiliations and Memberships

**Affiliate**, Computer Science area of the Harvard School of Engineering and Applied Sciences, Cambridge, MA (2020–present).

**Associate Member**, Broad Institute of MIT and Harvard, Cambridge, MA (2019–present).

**Faculty Affiliate**, Quantitative Biology Initiative at Harvard, Cambridge, MA (2018–present).

**Faculty Associate**, Harvard University Center for the Environment, Cambridge, MA (2017–present).

## Selected Awards

- National Science Foundation IIS-1924984 on "NRI: FND: Robust Grasping by Integrating Machine Learning with Physical Models" (Co-PI with Robert Howe; $749,998; 2019–2022)
- Harvard Milton Fund on "Statistically Removing Population Structure from GWAS" ($50k; 2019).
- Jerome H. Friedman Applied Statistics Dissertation Award (2017).
- Joint Statistical Meetings Student Travel Award (2016).
- Qualcomm Innovation Fellowship (5.5% acceptance rate; 2015).
- Statistics Department Teaching Assistant Award (2015).

# Teaching and Training

*Courses Taught at Harvard*

- Stat 195: Statistical Machine Learning, Fall '18, '19 – Undergraduate Level.
- Stat 211: Statistical Inference I, Fall '17, '18, '19 – Graduate Level.
- Stat 305: Statistical Consulting, Fall '18, '19, Spring '19, '20 – Graduate Level.
- Stat 314: Timely Topics in Statistics, Fall '18 – Graduate Level.
- Stat 315: Modern High-Dimensional Inference, Spring '18 – Graduate Level.
- Stat 303: The Art and Practice of Teaching Statistics, Fall '17 and Spring '18 – Graduate Level.

*Courses Taught at Stanford*

- STATS 302: Qualifying Exams Workshop, Summer '16 – Graduate Level.
- STATS 390: Consulting Workshop, Summer '14, '16 – Graduate Level.

*Undergraduate Student Supervision*

- Junu Lee (Spring 2020–present).
- Asher Spector (Fall 2019–present).
- David Yang (Fall 2019–Spring 2020).
- Abdul Saleh (Fall 2019–Spring 2020).
- Jessica Huang (Fall 2019–Spring 2020).
- Ryan Plunkett (Fall 2018–Spring 2019).
- Wentong Zhang (Fall 2017–Spring 2018).

*Masters Student Supervision*

- Alec Meade (Fall 2019–Spring 2020).

*Doctoral Student Supervision*

- Alexandre Bayle (Spring 2020–present).
- Dae Woong Ham (Fall 2019–present).
- Kelly Zhang (Spring 2019–present).
- Feicheng Wang (Fall 2018–present).
- Wenshuo Wang (Spring 2018–present).
- Lu Zhang (Spring 2018–present).
- Molei Liu (Fall 2017–present).
- Dongming Huang (Fall 2017–Spring 2020).

*Postdoctoral Student Supervision*

- Siyuan Ma (Fall 2019–present).

# University Service Activities

- William F. Milton Fund proposal reviewer (2020).
- Research Computing Faculty Advisory Group (2019–present).
- First-Generation Faculty Mentorship Program (2019–present).
- Organizer of Harvard Free Statistical Consulting Service (2018–present).
- Paper Selection Committee for Dempster Award (2018–present).
- Ph.D. Admissions Committee (2017–present).
- Undergraduate Studies Committee (2017–present).
- Statistics Colloquium Organizer (Spring 2018–Fall 2018).

# Professional Service Activities

*Workshops and Conference Committees*

- Program Committee, ACM-IMS Foundations of Data Science Conference (2020).
- Scientific Committee, Conference on Statistical Learning and Data Science/Nonparametric Statistics (2020).
- Organizing Committee, Eighth Annual New England Machine Learning Day (2019).

*Outreach*

- Guest Lecture "How Journalists Can Understand Data Science", ENG CNSR: Narrative Science Journalism (2019).
- Evaluation Chair, SAILORS: Stanford Artificial Intelligence Laboratory Outreach Summer (2016).
- Consultant, Stanford Statistics Free Consulting Service, over 100 consultees helped (2012-2016).
- Member, Statistics for Social Good Working Group at Stanford University (2013-2016).
- Judge, Seton Middle School Science Fair (2014-2016).

*Reviewer*

Journal of the Royal Statistical Society: Series B, Journal of the American Statistical Association, Annals of Statistics, Biometrika, Bernoulli, Biometrics, Electronic Journal of Statistics, Journal of Computational and Graphical Statistics, Scandinavian Journal of Statistics, SIAM Journal on Mathematics of Data Science, Statistica Sinica, Statistics & Probability Letters, Statistical Science, Stat, ACM-IMS Foundations of Data Science Conference Information and Inference, Conference on Neural Information Processing Systems (NeurIPS), Journal of Machine Learning Research, Discrete & Computational Geometry, Econometric Theory, Journal of Climate, International Journal of Robotics Research, American Control Conference, IEEE/RSJ International Conference on Intelligent Robots and Systems, IEEE Conference on Decision and Control, IEEE International Conference on Robotics and Automation, IEEE Robotics and Automation Letters, IEEE Transactions on Aerospace and Electronic Systems, IEEE Transactions on Automation Science and Engineering, IEEE Transactions on Mechatronics.

# Publications

* denotes alphabetized author order

## *In Preparation*

[P5] P. Bayle, A. Bayle, **L. Janson**\*, and L. Mackey\*. Cross-validation Confidence Intervals for Test Error. 2020. [https://arxiv.org/abs/2007.12671]

[P4] R. F. Barber\* and **L. Janson**\*. Testing Goodness-of-fit and Conditional Independence with Approximate Co-sufficient Sampling. 2020. [https://arxiv.org/abs/2007.09851]

[P3] L. Zhang and **L. Janson**. Floodgate: Inference for Model-Free Variable Importance. 2020. [https://arxiv.org/abs/2007.01283]

[P2] M. Liu, E. Katsevich, **L. Janson**\*, and A. Ramdas\*. Fast and Powerful Conditional Randomization Testing via Distillation. 2020. [https://arxiv.org/abs/2006.03980]

[P1] K. Zhang, **L. Janson**\*, and S. Murphy\*. Inference for Batched Bandits. 2020. [https://arxiv.org/abs/2002.03217]

## *Journal Articles*

[J14] S. Bates\*, E. Candès\*, **L. Janson**\*, and W. Wang\*. Metropolized Knockoff Sampling. *Journal of the American Statistical Association* (to appear), 2020+.

[J13] D. Huang, **L. Janson**. Relaxing the Assumptions of Knockoffs by Conditioning. *Annals of Statistics* (to appear), 2020+.

[J12] E. Candès\*, Y. Fan\*, **L. Janson**\*, and J. Lv\*. Panning for Gold: Model-X Knockoffs for High-dimensional Controlled Variable Selection. *Journal of the Royal Statistical Society: Series B*, 80(3):551–577, 2018.

[J11] Y. Chow, M. Ghavamzadeh, **L. Janson**, and M. Pavone. Risk-Constrained Reinforcement Learning with Percentile Risk Criteria. *Journal of Machine Learning Research*, 18(167):1–51, 2018.

[J10] **L. Janson**, B. Ichter, and M. Pavone. Deterministic Sampling-Based Motion Planning: Optimality, Complexity, and Performance. *International Journal of Robotics Research*, 37(1):46–61, 2018.

[J9] S. Tamang, A. Milstein, H. Sørensen, L. Pedersen, L. Mackey, J. Betterton, **L. Janson**, and N. Shah. Predicting Patient "Cost Blooms" in Denmark: a Longitudinal Population-Based Study. *BMJ Open*, 7(1), 2017.

[J8] **L. Janson**, R. Foygel Barber, and E. Candès. EigenPrism: Inference for High-Dimensional Signal-to-Noise Ratios. *Journal of the Royal Statistical Society, Series B*, 79(4):1037–1065, 2017.

[J7] **L. Janson**\*, and W. Su\*. Familywise Error Rate Control Via Knockoffs. *Electronic Journal of Statistics*, 10(1):960–975, 2016.

[J6] **L. Janson**, W. Fithian, and T. Hastie. Effective Degrees of Freedom: A Flawed Metaphor. *Biometrika*, 102(2):479–485, 2015.

[J5] G. Poultsides, T. Tran, E. Zambrano, **L. Janson**, D. Mohler, M. Well, R. Avedian, B. Visser, J. Lee, K. Ganjoo, E. Harris, J. Norton. Sarcoma Reconstruction With and Without Vascular Reconstruction: A Matched Case-Control Study. *Annals of Surgery*, 262(4):632–640, 2015.

[J4] S. Gholami, **L. Janson**, D. Worhunsky, T. Tran, M. Squires III, L. Jin, G. Spolverato, K. Votanopoulos, C. Schmidt, S. Weber, M. Bloomston, C. Cho, E. Levine, R. Fields, T. Pawlik, S. Maithel, B. Efron, J. Norton, and G. Poultsides. Number of Lymph Nodes Removed and Survival after Gastric Cancer Resection: An Analysis from the US Gastric Cancer Collaborative. *Journal of the American College of Surgeons*, 221(2):291–299, 2015.

[J3] **L. Janson**, E. Schmerling, A. Clark, and M. Pavone. Fast Marching Tree: a Fast Marching Sampling-Based Method for Optimal Motion Planning in Many Dimensions. *International Journal of Robotics Research*, 34(7):883–921, 2015.

[J2] **L. Janson** and B. Rajaratnam. A Methodology for Robust Multiproxy Paleoclimate Reconstructions and Modeling of Temperature Conditional Quantiles. *Journal of the American Statistical Association*, 109(505):63–77, 2014.

[J1] **L. Janson**\*, M. Klein\*, H. Lewis\*, A. Lucas\*, A. Marantan\*, and K. Luna. Undergraduate Experiment in Superconductor Point-Contact Spectroscopy with a Nb/Au Junction. *American Journal of Physics*, 80(2):133–140, 2012.

## *Refereed Conference Proceedings*

[C9] K. Solovey, **L. Janson**, E. Schmerling, E. Frazzoli, and M. Pavone. Revisiting the Asymptotic Optimality of RRT\*. In *IEEE Conference on Robotics and Automation*, Paris, France, May 2020.

[C8] A. Elhafsi, B. Ivanovic, **L. Janson**, and M. Pavone. Map-Predictive Motion Planning in Unknown Environments. In *IEEE Conference on Robotics and Automation*, Paris, France, May 2020.

[C7] **L. Janson**, T. Hu, and M. Pavone. Safe Motion Planning in Unknown Environments: Optimality Benchmarks and Tractable Policies. In *Robotics: Science and Systems*, Pittsburgh, Pennsylvania, June 2018.

[C6] E. Schmerling, **L. Janson**, and M. Pavone. Optimal Sampling-Based Motion Planning under Differential Constraints: the Drift Case with Linear Affine Dynamics. In *Conference on Decision and Control*, Osaka, Japan, December 2015.

[C5] **L. Janson**, B. Ichter, and M. Pavone. Deterministic Sampling-Based Motion Planning: Optimality, Complexity, and Performance. In *International Symposium on Robotics Research*, Sestri Levante, Italy, September 2015.

[C4] **L. Janson**\*, E. Schmerling\*, and M. Pavone. Monte Carlo Motion Planning for Robot Trajectory Optimization Under Uncertainty. In *International Symposium on Robotics Research*, Sestri Levante, Italy, September 2015.

[C3] J. Starek, J. Gomez, E. Schmerling, **L. Janson**, L. Moreno, and M. Pavone. An Asymptotically-Optimal Sampling-Based Algorithm for Bi-directional Motion Planning. In *IEEE/RSJ International Conference on Intelligent Robots and Systems*, Hamburg, Germany, September 2015.

[C2] E. Schmerling, **L. Janson**, and M. Pavone. Optimal sampling-based motion planning under differential constraints: the driftless case. In *IEEE Conference on Robotics and Automation*, Seattle, Washington, May 2015.

[C1] **L. Janson** and M. Pavone. Fast Marching Trees: a fast marching sampling-based method for optimal motion planning in many dimensions. In *International Symposium on Robotics Research*, Singapore, December 2013.

*Refereed Workshop Proceedings*

[W1] **L. Janson** and M. Pavone. Fast Marching Trees: a fast marching sampling-based method for optimal motion planning in many dimensions. In *Robotics: Science and Systems Workshop: Robotic Exploration, Monitoring, and Information Gathering*, Berlin, Germany, June 2013.

*Discussion Paper Comments*

[D1] **L. Janson**. Discussion on 'Random Projection Ensemble Classification'. *Journal of the Royal Statistical Society: Series B*, 79(4):1013–1014, 2017.

*Ph.D. Thesis*

[T1] **L. Janson**. A Model-Free Approach to High-Dimensional Inference. PhD thesis, Stanford University, Department of Statistics, 2017.

Last updated: August 21, 2020